

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently amended) A method for processing a film over a substrate in a process chamber, the method comprising:

flowing a process gas mixture suitable for processing the film over the substrate in the process chamber in accordance with a predetermined algorithm specifying process conditions;

monitoring a parameter during processing of the film over a thickness greater than 3  $\mu\text{m}$ ; and

changing the process conditions in response to a measured optical property of the film, wherein changing the process conditions comprises increasing, discretely, an ~~non-zero~~ RF source power **to control a vertical profile and a horizontal profile of the film.**

2. (Previously presented) The method recited in claim 1 further comprising forming a plasma in the process chamber from the process gas mixture.

3. (Original) The method recited in claim 1 wherein monitoring the parameter comprises monitoring the parameter during processing of the film over a thickness greater than 5  $\mu\text{m}$ .

Claims 4-5 (Cancelled)

6. (Original) The method recited in claim 1 wherein changing the process conditions is performed in response to a change in the parameter.

7. (Original) The method recited in claim 1 wherein the parameter comprises a process parameter.

8. (Original) The method recited in claim 1 wherein the parameter comprises a film-property parameter.

9. (Original) The method recited in claim 8 wherein the parameter comprises a reflectometry measurement.

10. (Original) The method recited in claim 8 wherein the parameter comprises an ellipsometry measurement.

11. (Original) The method recited in claim 1 wherein the parameter comprises a stress uniformity of the film.

Claims 12-14 (Cancelled)

15. (Original) The method recited in claim 1 wherein changing the process conditions is performed to maintain a substantially constant value for the optical property of the film throughout processing the film.

16. (Original) The method recited in claim 1 wherein changing the process conditions is performed to deposit the film with a desired variation in the optical property of the film throughout processing the film.

17. (Previously presented) The method recited in claim 1 wherein the process gas mixture comprises a silicon-containing gas and an oxygen-containing gas.

18. (Original) The method recited in claim 1 wherein processing the film comprises depositing the film.

19. (Original) The method recited in claim 1 wherein processing the film comprises etching the film.

20. (Original) The method recited in claim 1 further comprising annealing the film.

21. (Currently amended) A method for forming an optical waveguide over a substrate in a process chamber, the method comprising:  
forming a plasma in the process chamber;  
flowing a process gas mixture comprising a silicon-containing gas and an oxygen-containing gas in the process chamber in accordance with a predetermined algorithm specifying process conditions to deposit a film over the substrate;  
monitoring a refractive-index value of the film during deposition of the film over a thickness greater than 3  $\mu\text{m}$ ; and  
changing the process conditions during deposition in accordance with a correlation between the refractive-index value and the process conditions, wherein changing the process conditions comprises increasing an RF source power, continuously, for maintaining the plasma **to control a vertical profile and a horizontal profile of the film.**

22. (Original) The method recited in claim 21 wherein monitoring the refractive-index value comprises monitoring the refractive-index value of the film during deposition of the film over a thickness greater than 5  $\mu\text{m}$ .

Claims 23-27 (Cancelled)

28. (Original) The method recited in claim 21 wherein changing the process conditions is performed to maintain a substantially constant value for the refractive-index value throughout the deposition.

29. (Original) The method recited in claim 21 wherein changing the process conditions is performed to deposit the film with a desired variation in the refractive-index value throughout the deposition.

Claims 30-32 (Cancelled)

33. (Original) The method recited in claim 21 further comprising annealing the film.

34. (Withdrawn) A thick-film processing system comprising:

- a housing defining a process chamber;
- a plasma-generating system operatively coupled to the process chamber;
- a substrate holder configured to hold a substrate during substrate processing;
- a gas-delivery system configured to introduce gases into the process chamber;
- a pressure-control system for maintaining a selected pressure within the process chamber;
- a sensor disposed to monitor a parameter during processing within the process chamber;
- a controller for controlling the plasma-generating system, the gas-delivery system, the sensor, and the pressure-control system; and
- a memory coupled with the controller, the memory comprising a computer-readable medium having a computer-readable program embodied therein for directing operation of the thick-film processing system, the computer-readable program including:
  - instructions to control the plasma-generating system to form a plasma in the process chamber;
  - instructions to control the gas-delivery system to flow a process gas suitable for depositing the film over the substrate in accordance with a predetermined algorithm specifying process conditions;
  - instructions to control the sensor to monitor the parameter during processing of the film over a thickness greater than 3  $\mu\text{m}$ ; and
  - instructions to change the process conditions in accordance with a correlation among a value of the parameter, an optical property of the film, and the process conditions.

35. (Withdrawn) The thick-film processing system recited in claim 34 wherein the instructions for monitoring the parameter comprise instructions for monitoring the parameter over a thickness greater than 5  $\mu\text{m}$ .

36. (Withdrawn) The thick-film processing system recited in claim 34 wherein the predetermined algorithm is optimized to control a vertical profile of the film.

37. (Withdrawn) The thick-film processing system recited in claim 34 wherein the predetermined algorithm is optimized to control a horizontal profile of the film.

38. (Withdrawn) The thick-film processing system recited in claim 34 wherein the instructions to change the process conditions are executed in response to a change in the parameter.

39. (Withdrawn) The thick-film processing system recited in claim 34 wherein the sensor comprises a reflectometer.

40. (Withdrawn) The thick-film processing system recited in claim 34 wherein the sensor comprises an ellipsometer.

41. (Withdrawn) The thick-film processing system recited in claim 34 wherein the sensor is configured to measure a stress of the film.

42. (Withdrawn) The thick-film processing system recited in claim 34 wherein the instructions for changing the process conditions are executed to maintain a substantially constant value for the optical property of the film throughout depositing the film.

43. (Withdrawn) The thick-film processing system recited in claim 34 wherein the instructions for changing the process conditions are executed to deposit the film with a desired variation in the optical property of the film.